LISTING OF CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Withdrawn) An image input apparatus comprising:

an image pickup unit which optically scans a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup unit obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a relative change detection unit which detects an amount of relative change in position or speed of said image pickup unit between a time when a previous partial image was taken and a time when a current partial image is being taken;

an overlapping amount calculating unit which calculates an amount of overlap between the previous partial image and the current partial image based upon the amount of relative change in position or speed detected by said relative change detection unit; and

an image recording determination unit which determines whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating unit.

2. (Withdrawn) The image input apparatus according to claim 1, further comprising:

a distance detection unit which detects a distance between the subject and said image pickup unit, wherein said overlapping amount detection unit calculate the amount of overlap between the partial images based an information including the distance detected by said distance detection unit.

3. (Withdrawn) The image input apparatus according to claim 1, further comprising:

an inclination detection unit which detects inclination of the subject,

wherein said overlapping amount detection unit calculate the amount of overlap between the partial images based on an information including the inclination detected by said inclination detection unit.

4. (Withdrawn) The image input apparatus according to claim 1, further comprising:

a timer which counts time that has elapsed time from when the previous partial image was acquired,

wherein said image recording determination unit determines whether or not the current partial images can be recorded based on an information including the time counted by said timer.

5. (Withdrawn) The image input apparatus according to claim 1, wherein said image recording determination unit stops acquiring the images when the amount of shift of said image pickup unit is greater than a desired value.

6. (Withdrawn) The image input apparatus according to claim 1, further comprising an image composing unit which composes all or a portion of the partial images of the subject to obtain a single image.

7. (Withdrawn) An image input apparatus comprising:

an image pickup unit which optically scans a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup unit obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

an angle detection unit which detects a change in angle of the image pickup unit based upon rotation angular velocities around two axes that are virtually parallel with an optic axis of said image pickup unit and mutually perpendicular to each to other between a time when a previous partial image was taken and a time when a current partial image is being taken;

an overlapping amount calculating unit which calculates an amount of overlap between the previous partial image and the current partial image based upon the change in angles detected by said angle detection unit; and

an image recording determination unit which determines whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating unit.

8. (Withdrawn) The image input apparatus according to claim 7, further comprising:

a distance detection unit which detects a distance between the subject and said image pickup unit,

wherein said overlapping amount detection unit calculate the amount of overlap between the partial images based an information including the distance detected by said distance detection unit.

9. (Withdrawn) The image input apparatus according to claim 7, further comprising:

an inclination detection unit which detects inclination of the subject,

wherein said overlapping amount detection unit calculate the amount of overlap between the partial images based on an information including the inclination detected by said inclination detection unit.

10. (Withdrawn) The image input apparatus according to claim 7, further comprising: timer which counts time that has elapsed time from when the previous partial image was acquired,

wherein said image recording determination unit determines whether or not the current partial images can be recorded based on an information including the time counted by said timer.

11. (Withdrawn) The image input apparatus according to claim 7, wherein said image recording determination unit stops acquiring the images when the amount of shift of said image pickup unit is greater than a desired value.

12. (Withdrawn) The image input apparatus according to claim 7, further comprising an image composing unit which composes all or a portion of the partial images of the subject to obtain a single image.

13. (Withdrawn) An image input apparatus comprising:

an image pickup unit which optically scans a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup unit obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

an orientation detection unit which detects an orientation of the image pickup unit based upon rotation angular velocities around two axes that are virtually parallel with an optic axis of said image pickup unit and mutually perpendicular to each to other between a time when a previous partial image was taken and a time when a current partial image is being taken;

a relative change detection unit which detects an amount of relative change in position or speed of the image pickup unit between a time when a previous partial image was taken and a time when a current partial image is being taken;

an overlapping amount calculating unit which calculates an amount of overlap between the partial images taken at the previous input time and the partial images taken at the current input time based upon the amount of relative change in position or speed detected by said relative change detection unit and the orientation detected by the orientation detection unit; and

an image recording determination unit which determines whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating unit.

14. (Withdrawn) The image input apparatus according to claim 13, further comprising:

a distance detection unit which detects a distance between the subject and said image pickup unit,

wherein said overlapping amount detection unit calculate the amount of overlap between the partial images based an information including the distance detected by said distance detection unit.

15. (Withdrawn) The image input apparatus according to claim 13, further comprising:

an inclination detection unit which detects inclination of the subject,

wherein said overlapping amount detection unit calculate the amount of overlap between the partial images based on an information including the inclination detected by said inclination detection unit.

16. (Withdrawn) The image input apparatus according to claim 13, further comprising:

a timer which counts time that has elapsed time from when the previous partial image was acquired,

wherein said image recording determination unit determines whether or not the current partial images can be recorded based on an information including the time counted by said timer.

17. (Withdrawn) The image input apparatus according to claim 13, wherein said image recording determination unit stops acquiring the images when the amount of shift of said image pickup unit is greater than a desired value.

18. (Withdrawn) The image input apparatus according to claim 13, further comprising an image composing unit which composes all or a portion of the partial images of the subject to obtain a single image.

19. (Withdrawn) An image input apparatus comprising:

an image pickup unit which optically scans a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup unit obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a plurality of line sensors each of which detects an amount of shift of said image pickup unit in the horizontal direction and in the vertical direction;

an overlapping amount calculating unit which determines an amount of shift from input waveforms of the line sensors between the previous partial image and the current partial image, and calculates an amount of overlap between the previous partial image and the current partial image based upon the amount of shift; and

an image recording determination unit which determines whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating unit.

20. (Withdrawn) The image input apparatus according to claim 19, further comprising:

a timer which counts time that has elapsed time from when the previous partial image was acquired,

wherein said image recording determination unit determines whether or not the current partial images can be recorded based on an information including the time counted by said timer.

21. (Withdrawn) The image input apparatus according to claim 19, wherein said image recording determination unit stops acquiring the images when the amount of shift of said image pickup unit is greater than a desired value.

22. (Withdrawn) The image input apparatus according to claim 19, further comprising an image composing unit which composes all or a portion of the partial images of the subject to obtain a single image.

23. (Currently Amended) An image input apparatus comprising:

a first image pickup unit ~~which optically scans~~ configured to optically scan a subject and thereby ~~acquires~~ to acquire plural images of the subject that are partial images of the subject, wherein said first image pickup unit ~~obtains~~ is further configured to obtain the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a second image pickup unit which configured to continuously ~~picks~~ pick up the image that is being scanned;

an overlapping amount calculating unit ~~which calculates~~ configured to calculate an amount of overlap between the partial images picked up by said first image pickup unit based upon the image picked up by said second image pickup unit; and

an image recording determination unit ~~which determines~~ configured to determine whether or not ~~the~~ a current partial image is to be recorded based upon the amount of overlap calculated by the overlapping amount calculating unit, said image recording unit including a control unit responsive to the determination that a current partial image is to be recorded to automatically perform the recording.

24. (Currently Amended) ~~The~~ An image input apparatus ~~according to claim 23, further~~ comprising:

a first image pickup unit configured to optically scan a subject and thereby to acquire plural images of the subject that are partial images of the subject, wherein said first image pickup unit is further configured to obtain the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a second image pickup unit configured to continuously pick up the image that is being scanned;

an overlapping amount calculating unit configured to calculate an amount of overlap between the partial images picked up by said first image pickup unit based upon the image picked up by said second image pickup unit;

a timer ~~which counts~~ configured to count time that has elapsed ~~time~~ from when ~~the~~ a previous partial image was acquired[[,]]; and

an ~~wherein said~~ image recording determination unit configured to determine whether or not a ~~the~~ current partial image being scanned by the first image pickup unit can be recorded based on an information including the amount of overlap calculated by the overlapping amount calculating unit and the time counted by said timer.

25. (Currently Amended) The image input apparatus according to claim 23, wherein said image recording determination unit ~~stops~~ is further configured to stop acquiring the partial images when ~~the~~ an amount of shift of said first image pickup unit is greater than a desired value.

26. (Currently Amended) The image input apparatus according to claim 23, further comprising an image composing unit ~~which composes~~ configured to compose all or a portion of the partial images of the subject to obtain a single image.

27. (Withdrawn) An image input apparatus comprising:

an image pickup unit which optically scans a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup unit obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a timer which counts time that has elapsed time from when the previous partial image was acquired; and

an image recording determination unit which determines whether or not the current partial image is to be recorded based on the time counted by the timer.

28. (Withdrawn) The image input apparatus according to claim 27, wherein said image recording determination unit determines that the current image is not to be recorded when the amount of shift of said image pickup unit is greater than a predetermine value.

29. (Withdrawn) The image input apparatus according to claim 27, further comprising an image composing unit which composes all or a portion of the partial images of the subject to obtain a single image.

30. (Withdrawn) An image input method comprising:

an image pickup step for optically scanning a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup step obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a relative change detection step for detecting an amount of relative change in position or speed of said image pickup step between a time when a previous partial image was taken and a time when a current partial image is being taken;

an overlapping amount calculating step for calculating an amount of overlap between the previous partial image and the current partial image based upon the amount of relative change in position or speed detected by said relative change detection step; and

an image recording determination step for determining whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating step.

31. (Withdrawn) An image input method comprising:

an image pickup step for optically scanning a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup step obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

an angle detection step for detecting a change in angle of the image pickup step based upon rotation angular velocities around two axes that are virtually parallel with an optic axis of said image pickup step and mutually perpendicular to each to other between a time when a previous partial image was taken and a time when a current partial image is being taken;

an overlapping amount calculating step for calculating an amount of overlap between the previous partial image and the current partial image based upon the change in angles detected by said angle detection step; and

an image recording determination step for determining whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating step.

32. (Withdrawn) An image input method comprising:

an image pickup step for optically scanning a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup step obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

an orientation detection step for detecting an orientation of the image pickup step based upon rotation angular velocities around two axes that are virtually parallel with an optic axis of said image pickup step and mutually perpendicular to each to other between a time when a previous partial image was taken and a time when a current partial image is being taken;

a relative change detection step for detecting an amount of relative change in position or speed of the image pickup step between a time when a previous partial image was taken and a time when a current partial image is being taken;

an overlapping amount calculating step for calculating an amount of overlap between the partial images taken at the previous input time and the partial images taken at the current input time based upon the amount of relative change in position or speed detected by said relative change detection step and the orientation detected by the orientation detection step; and

an image recording determination step for determining whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating step.

33. (Withdrawn) An image input method comprising:

an image pickup step for optically scanning a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping portions, wherein said image pickup step obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a detecting step for detecting an amount of shift of said image pickup step in the horizontal direction and in the vertical direction;

an overlapping amount calculating step for determining an amount of shift from input waveforms of the line sensors between the previous partial image and the current partial image, and calculates an amount of overlap between the previous partial image and the current partial image based upon the amount of shift; and

an image recording determination step for determining whether or not the current partial image is to be recorded based upon the amount of overlap calculated by said overlapping amount calculating step.

34. (Withdrawn) An image input method comprising:

a first image pickup step for optically scanning a subject and thereby acquires plural images of the subject that are partial images of the subject, wherein said image pickup step obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a second image pickup step for continuously picking up the image that is being scanned;

an overlapping amount calculating step for calculating an amount of overlap between the partial images picked up by said first image pickup step based upon the image picked up by said second image pickup step; and

an image recording determination step for determining whether or not the current partial image is to be recorded based upon the amount of overlap calculated by the overlapping amount calculating step.

35. (Withdrawn) An image input method comprising:

an image pickup step for optically scanning a subject and thereby successively acquires plural images of the subject that are partial images of the subject having overlapping

portions, wherein said image pickup step obtains the partial images by moving in a plane that is parallel to a plane of the subject and without touching the subject;

a counting step for counting time that has elapsed time from when the previous partial image was acquired; and

an image recording determination step for determining whether or not the current partial image is to be recorded based on the time counted by said counting step.

36. (New) An image input apparatus comprising:

a first optical scanning and pickup means for optically scanning a subject by moving the first optical scanning and pickup means in a plane that is parallel to a plane of the subject without touching the subject to acquire plural partial images of the subject;

a second optical scanning and pickup means for scanning and continuously picking up an image of the subject;

an overlapping amount calculating means for calculating an amount of overlap between the partial images picked up by said first optical scanning and pickup means based upon the image picked up by said second optical scanning and pickup means; and

an image recording determination means for determining whether or not a current partial image is to be recorded based upon the amount of overlap calculated by the overlapping amount calculating means, said image recording means including a control means responsive to the determination that a current partial image is to be recorded for automatically performing the recording.

37. (New) The image input apparatus according to claim 36, wherein said image recording determination means stops acquiring the partial images when an amount of shift of said first image pickup means is determined to be greater than a desired value.

38. (New) The image input apparatus according to claim 36, further comprising an image composing means for composing all or a portion of the partial images of the subject to obtain a single image.

39. (New) An image input apparatus comprising:

a first optical scanning and image pickup means for optically scanning a subject by moving the first optical scanning and image pickup means in a plane that is parallel to a plane of the subject without touching the subject to acquire plural partial images of the subject from the first optical scanning and image pickup means;

a second optical scanning and pickup means for scanning and continuously picking up an image of the subject;

an overlapping amount calculating means for calculating an amount of overlap between the partial images picked up by said first optical scanning and pickup means based upon the image picked up by said second optical scanning and pickup means;

a timer means for counting time that has elapsed from when a previous partial image was acquired; and

an image recording determination means for determining whether or not a current partial image being scanned by the first optical scanning and pickup means can be recorded based on information including the amount of overlap calculated by the overlapping amount calculating means and the time counted by said timer means.

40. (New) An image inputting method comprising steps of:

optically scanning a subject with a first optical scanning and pickup unit by moving the first optical scanning image unit in a plane that is parallel to a plane of the subject without

touching the subject to acquire plural partial images of the subject from the first optical scanning and pickup unit;

scanning and continuously picking up an image of the subject with a second optical scanning and pickup unit;

calculating an amount of overlap between the partial images picked up by said first optical scanning and pickup unit based upon the image picked up by said second optical scanning and pickup unit;

determining whether or not a current partial image is to be recorded based upon the amount of overlap calculated in the calculating step; and

automatically performing recording responsive to the determining step determining that a current partial image is to be recorded.

41. (New) The image inputting method according to claim 40, further comprising a step of determining that an amount of shift of said first optical scanning and pickup unit is greater than a desired value and stopping the further acquiring of the partial images.

42. (New) The image input apparatus according to claim 36, further comprising a step of composing all or a portion of the partial images of the subject to obtain a single image.

43. (New) An image inputting method comprising steps of:

optically scanning a subject with a first optical scanning and pickup unit by moving the first optical scanning image unit in a plane that is parallel to a plane of the subject without touching the subject to acquire plural partial images of the subject from the first optical scanning and pickup unit;

scanning and continuously picking up an image of the subject with a second optical scanning and pickup unit;

calculating an amount of overlap between the partial images picked up by said first optical scanning and pickup unit based upon the image picked up by said second optical scanning and pickup unit;

counting time that has elapsed from when a previous partial image was acquired; and

determining whether or not a current partial image being scanned by the first optical scanning and pickup unit can be recorded based on information including the amount of overlap calculated in the calculating an amount of overlap step and the time counted by the counting time step.